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ox, deer, etc. This part was nine feet thick in the course of the new channel cut for the Orwell river. Fishermen frequently bring up lumps of peat. Trunks of trees stand at Helm Searf, Norfolk. This confirms the theory of the marshy conditions prevalent previous to the submergence that converted Britain into an island. —Professor T. R. Jones, in the fifteenth of a series of articles upon the Palæozoic bivalved Entomostraca, in the *Annals and Magazine of Natural History*, describes a carboniferous *Primitia*. In the same magazine (Sept. 1882), Dr. J. C. Hinde describes several fossil *Calcispongia*.

MINERALOGY.¹

ANALYSES OF SOME VIRGINIA MINERALS.—Professor J. W. Mallet has communicated to the *Chemical News* some notes of work done by students at the University of Virginia upon American minerals.

W. T. Page has analyzed an allanite of unusual chemical composition from Bedford county, Va. It occurred as a compact black mass, with pitch-like luster, spec. grav. 4.32, and the unusual hardness of nearly 7. Its composition is as follows:

SiO ₂	Al ₂ O ₃	Ce ₂ O ₃	Di ₂ O ₃	La ₂ O ₃	Fe ₂ O ₃	FeO	MnO
26.70	6.34	33.76	16.34	1.03	3.21	4.76	trace
BeO	MgO	CaO	Na ₂ O	K ₂ O	H ₂ O		
0.52	0.54	2.80	0.49	0.55	1.99		

The very large proportion of the cerium metals present (over 50 per cent., or double the usual amount), and the large excess of didymium over lanthanum are peculiarities which may justify its being considered as a new variety of allanite.

B. E. Sloan has reëxamined the helvite of Amelia C. H., Va., already referred to in the *NATURALIST*. Having at his command a larger amount of pure material than Mr. Haines possessed, a new analysis was made which conforms more closely to the formula adopted by Rammelsberg. The analysis gave:

SiO ₂	BeO	MnO	FeO	Al ₂ O ₃	Mn	S
31.42	10.97	40.56	2.99	0.36	8.59	4.9 = 99.88.

W. H. Seaman analyzed a pale hyacinth-red garnet from the same locality, which, like the other recorded analyses of the same variety of garnet—spessartite, or aluminum-manganese garnet, shows an anomalous deficiency of triad as compared with dyad metals.

R. N. Musgrave has analyzed the albite from the same locality, the analysis closely corresponding to the tri-silicate formula $\text{Na Al Si}_3 \text{O}_8$. The albite here occurs as a delicately aggregated mass of colorless flattened crystals, forming beautiful specimens.

A supposed metallic meteorite from Augusta county—a pear-

¹ Edited by Professor H. CARVILL LEWIS, Academy of Natural Sciences, Philadelphia, to whom communications, papers for review, etc., should be sent.

shaped mass of iron covered with an oxidized crust—was examined by the same analyst found to be of terrestrial and artificial origin.

On the other hand, some rough, flattened scales of iron, with jagged edges and often twisted as though made by a lathe, which were found in the sand accompanying native gold in the bed of Brush creek, Montgomery county, and which W. T. Page has analyzed, are regarded as specimens of native iron. The largest grains weighed as much as 60–80 milligrammes, while the smallest were almost dust. Analysis showed traces of copper, sulphur and quartz. The scales were but slightly oxidized. The method of occurrence rendered it improbable that these scales could have been detached from the picks and shovels used at the washings.

ANALYSES OF SOME NORTH CAROLINA MINERALS.—In the same laboratory several North Carolina minerals have been examined.

W. T. Page examined the auriferous sand from Burke county, N. C., and found in addition to zircon, monazite, magnetite, etc., a number of malleable metallic grains, which, like those of the Virginia sand, referred to above, were often irregular, twisted and jagged. They were almost pure iron, mere traces of cobalt and quartz being present. The extended distribution of native terrestrial iron, thus shown, is of great interest.

Mr. Seaman has analyzed fergusonite from Brindletown, Burke county. It occurs in small reddish-brown crystals of tetragonal habit, and was first noticed by Mr. W. E. Hidden. Some four per cent. of tantalic acid was shown to accompany the columbium, the presence of didymium and lanthanum also being proved. Metals of the yttrium group, but of higher atomic weight (erbium, ytterbium, etc.) occur in small proportion with the yttrium. Counting the water as basic the ortho-columbate formula is deduced: $M''' Nb O_4$.

Mr. Seaman has also analyzed a columbate from the Wiseman mica mine of Mitchell county, which had formerly been regarded as euxenite, but which is shown to agree neither in physical characters nor in chemical composition with that species. The substance is compact, reddish-brown in color, with luster between resinous and adamantine, and with pale yellowish-brown streak. Hardness = 5.5. Spec. grav. = 4.33. The analysis gave

Ch ₂ O ₅	WO ₃	SnO ₂	UO ₂	Y ₂ O ₃	Ce ₂ O ₃	Di ₂ O ₃	La ₂ O ₃	FeO
47.09	0.40		15.15	13.46	1.40	4.00		7.09
CaO	H ₂ O							
1.53	9.55 = 99.67.							

Unlike euxenite, no titanium is present, and the deduced formula is that of an ortho-columbate, $M'''_3 Cb_2 O_8$, while euxenite is a meta-columbate. The percentage of water, the low specific gravity and the appearance of the mineral, with its external crust of

yellowish material which sometimes penetrates the interior, indicate that it is a product of the alteration of samarskite or some allied species.

At the same locality a mineral allied to allanite occurs as flattened crystals of pitch-black color, brownish-gray streak and with an imperfect conchoidal fracture. $H. = 6$. Sp. gr. = 3.15. Analysis gave:

SiO ₂	Al ₂ O ₃	Y ₂ O ₃	Ce ₂ O ₃	Fe ₂ O ₃	FeO	MgO	CaO	H ₂ O
39.03	14.33	8.20	1.53	7.10	5.22	4.29	17.47	2.78 = 99.95

In the very small percentage of cerium it contrasts strikingly with the mineral from Bedford county, Va., of which the analysis is given above. The different proportions of the other constituents also point to the mineral as a distinct variety of allanite.

A NEW VARIETY OF BOURNONITE. — A specimen resembling "Fahlerz," found at the Great Eastern mine, Park county, Colorado, has been analyzed by W. T. Page. The mineral was steel-gray in color, with metallic luster and dark-red streak, with a crystalline structure and brittle, uneven fracture, having a hardness of about 4, and specific gravity of 4.89. It fuses and gives antimonial fumes before the blowpipe. Analysis gave:

S	Sb	Cu	Zn	Fe	Pb	siliceous residue
26.88	34.47	23.20	7.14	1.38	1.19	5.86 = 100.12

The copper exists one-half as cuprous and one-half as cupric sulphide. It is as distinct a species as stylumite, but in order to avoid multiplication of names it is suggested that both stylumite and the species here described be considered as varieties of bournonite.

NATIVE GOLD ALLOYS.—Mr. W. H. Seaman has examined a number of grains, which, picked out by the aid of a lens from the platinum grains of Colombia, S. A., are shown to consist of gold alloyed in different proportions with silver, copper or mercury. A gold-copper alloy contained nearly sixteen per cent. of copper, while an alloy of gold, silver and mercury contained eighty-four per cent. of gold and seven per cent. of each of the two latter metals.

Another alloy obtained from Taguaril, Brazil, contained eight per cent. of palladium, and corresponded with the formula, Pd Au₆. The palladium gave it a bronze-like color.

SOME GREENLAND MINERALS.—In a paper on some minerals from the sodalite-syenite of South Greenland, Mr. Joh. Lorenzen gives a number of analyses of interest. Among the substances analyzed were microcline, arfvedsonite, ægirite, nephelite, eudialite, lievrite and lepidolite. It is interesting to observe that most of these substances occur similarly associated in Southern Norway. The rock, composed principally of microcline, arfvedsonite and sodalite has frequently a reddish-brown color, due to an ad-

mixture of garnet-colored eudialite. The lepidolite was shown to have a composition differing from that usually ascribed to that species in having a larger percentage of silica, less than half the quantity of alumina, and unusually large quantities of alkalis and of water, while no fluorine was present. It is fusible in a candle-flame. This may be a new species of the mica group.

Another mineral of interest occurs in curved, irregular crystals in the same rock. It has a hardness of 4, specific gravity 3.38, and has a brown color and white streak. It fuses readily before the blowpipe to a gray, dull bead.

The following composition was obtained :

SiO ₂	TaO ₂	Fe ₂ O ₃	Al ₂ O ₃	ThO	MnO	CeO	LaO	DiO
27.95	0.97	9.71	2.41	7.09	4.20	10.66	17.04	
CaO	Na ₂ O	H ₂ O						
3.09	7.98	7.28	= 98.38					

The substance appearing to be a new species, the author has named it *Steenstrupine*, after Mr. Steenstrup, the discoverer of the mineral.

TIN IN ALABAMA.—It is reported that valuable loads of tin-bearing rocks have been discovered at the Broad Arrow mines, near Ashland, Clay county, Alabama. The tin occurs as cassiterite finely disseminated in gneiss. The ore is being crushed and reduced to the metallic state on the spot, works having been erected for the purpose. A bar of tin thus made has already been received in New York.

TELLURIFEROUS COPPER.—Professor T. Egleston, of N. Y., has reported to the American Institute of Mining Engineers an interesting case of the presence of tellurium in copper and of its effect upon the latter metal.

Some copper ore from Colorado had been sent to him to examine for arsenic and antimony. Finding neither metal present, a large quantity of the ore was purchased by a metallurgical firm, who, however, reported that they were unable to refine it, the furnaces having been "poisoned" by arsenic or antimony. Upon a re-examination of a larger quantity of material a trace of tellurium was discovered, the quantity being less than one-tenth of a per cent.

Although present in such minute quantity, the tellurium rendered the copper "red-shot." When the refined copper was passed through the rollers cracks showed themselves, which became larger the more the copper was rolled, until finally the cake of copper fell to pieces. When heated repeatedly the copper became covered with a white powder consisting of oxide of tellurium. No amount of heating could remove the tellurium or improve the quality of the copper. The influence of such a minute quantity of tellurium upon the copper is surprising.